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**Applied
Statistics
Training
Institute**

Bulletin of Courses
1982

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Calendar of Courses

January-June 1982

Course Number	Title	Location
112	National Health Data Sources	Philadelphia
200	Vital Statistics: Measurement and Utilization	San Francisco
202	Vital Statistics Records and Their Administration	San Francisco
300	Statistical Methods in Public Health I	Orlando
301	Statistical Methods in Public Health II	Philadelphia
302	Estimating Parameters From Sample Surveys	Philadelphia
303	Health Survey Methods and Procedures	Orlando
304	Life Table Methods in Health and Mental Health Programs	Orlando
305	Forecasting Health Services Utilization	Orlando
306	Statistical Methods in Health Services Delivery and Administration	Orlando
310	Multiple Regression and the Analysis of Health Data	Philadelphia
400	Demographic Analysis I	Orlando
601	Technical Report Writing	San Francisco
604	Tabular and Graphic Presentation of Data	Philadelphia
605	The Elements of a Complete Statistical Report	San Francisco
702	Automatic Data Processing and Computer Terminal Usage	Philadelphia
709	Biostatistical Software for Health Applications	Philadelphia
801	Basic Underlying Cause of Death	Austin and Sacramento
802	Advanced Underlying Cause of Death	Jacksonville and Sacramento

The above courses are planned for calendar year 1982. Please refer to the ASTI Calendar of courses for specific dates.

**Applied
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1982



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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Office of Health Research, Statistics, and Technology
National Center for Health Statistics
Cooperative Health Statistics System

Hyattsville, Maryland
October 1981

best copy available

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THE ASTI PROGRAM

1

The National Center for Health Statistics (NCHS) offers opportunities for training in the practical aspects of health statistics through the intensive, short-term, public-health oriented courses of the Applied Statistics Training Institute (ASTI).

State and local health agencies today are involved in health planning, design and evaluation of health care systems, and development of management information systems for comprehensive health programs. ASTI seeks to upgrade the professional skills of statisticians working in the health sciences by bridging the gap between basic statistical theory and the application of statistical principles to the day-to-day demands of public health work.

The goals of the ASTI program are:

- to train health professionals to use statistical tools
- to train statisticians to understand health problems
- to provide training relevant to current health legislation and directives
- to train personnel involved in the Cooperative Health Statistics System (CHSS) in the design and implementation of the CHSS components
- to enhance the effectiveness of health system decision-making by improving the collection, analysis, and utilization of health data

SELECTION OF COURSES

2

All ASTI courses stress job-related applications. However, basic statistical theory and principles are included wherever required for specific statistical techniques. The curriculum has been divided into five major categories, each consisting of groups of related courses in a suggested sequence.

The course locator guide which follows is designed to assist prospective students in selecting the course or courses most appropriate to their needs.

GROUPINGS OF COURSES BY JOB FUNCTION

TECHNICAL OPERATIONS

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Group 1. Cooperative Health Statistics System Operations

Subjects covered: Vital statistics, health resources utilization statistics, long-term care, hospital care and ambulatory care, data processing systems, and use of on-line, interactive terminals.

Courses:

- 200 Vital Statistics: Measurement and Utilization
- 240 Health Manpower and Facilities Resources Statistics
- 702 Automatic Data Processing and Computer Terminal Usage

Group 2. Vital Records Administration

Subjects covered: Vital statistics, principles of administration of a vital records system, and use of microfilm techniques for vital records.

Courses:

- 200 Vital Statistics: Measurement and Utilization
- 202 Vital Statistics Records and Their Administration
- 222 Microfilm for Vital Records

Group 3. Cause-of-Death Coding

Subjects Covered: Principles of cause-of-death coding using ICD 9

Courses:

- 801 Basic Cause-of-Death Classification
- 802 Advanced Cause-of-Death Classification

PROGRAM MANAGEMENT

Group 1. Program Definition

Subjects Covered: Management of health data, principles of health planning and evaluation, preparation of a protocol for evaluation of health programs, data processing systems and principles.

Courses:

- 100 Management of Health Data
- 101 Health Program Planning and Evaluation
- 103 Research Methods in Evaluation of Health Programs
- 110 The Health Policy Process: Development, Evaluation and Analysis
- 702 Automatic Data Processing and Computer Terminal Usage

Group 2. Technical Communication

Subjects Covered: Organization of data, principles of medical classification, data processing principles and systems, and tabular and graphic presentation of data.

Courses:

- 100 Management of Health Data
- 112 National Health Data Sources
- 803 Nature and Use of a Mortality Data System
- 805 Morbidity Classification Systems
- 702 Automatic Data Processing and Computer Terminal Usage
- 601 Technical Report Writing
- 604 Tabular and Graphic Presentation of Data
- 605 Design and Composition of a Complete Statistical Report

Group 3. Survey Methodology

Subjects Covered: Management of health data, design of surveys (including telephone surveys) and selection of estimators; and planning and implementation of a survey.

Courses:

- 100 Management of Health Data
- 302 Estimating Parameters from Sample Surveys
- 303 Health Survey Methods and Procedures

STATISTICS

Group 1. Program Analysis (Epidemiology)

Subjects Covered: Use of life tables in health sciences, statistical methods in epidemiology, perinatal and infant health, statistical methods in chronic disease control programs, family planning statistics, and comparative analysis of community health care delivery systems.

Courses:

- 304 Life Table Methods in Health and Mental Health Programs
- 231 Perinatal and Infant Health: Morbidity and Mortality Analysis
- 233 Epidemiological Methods for Planning and Management of Health Programs
- 216 Family Planning Statistics
- 308 Comparative Analysis of Community Health Care Delivery Systems

Group 2. Demographic Techniques

Subjects Covered: Life tables in health sciences, demographic analysis, population estimation and forecasting.

Courses:

- 304 Life Table Methods in Health and Mental Health Programs
- 400 Demographic Analysis I
- 401 Demographic Analysis II
- 402 Methods of Estimating Populations
- 403 Methods of Forecasting Populations

STATISTICAL ANALYSIS

Group 1. Statistical Techniques

Subjects Covered: Statistical methods in public health, multiple regression and the analysis of health data, life tables in health sciences, analysis of categorical data.

Courses:

- 300 Statistical Methods in Public Health I
- 301 Statistical Methods in Public Health II
- 310 Multiple Regression and the Analysis of Health Data
- 304 Life Table Methods in Health and Mental Health Programs
- 312 Statistical Methods for Analyzing Descriptive Data

Group 2. Analytical Techniques

Subjects Covered: Statistical methods in public health, multiple regression and the analysis of health data, statistical software.

Courses:

- 300 Statistical Methods in Public Health I
- 301 Statistical Methods in Public Health II
- 310 Multiple Regression and the Analysis of Health Data
- 709 Biostatistical Software for Health Applications

HEALTH PLANNING

Group 1. Health Plan Development

Subjects Covered: Statistics for health planning, information methods for health planning, techniques for evaluating health programs, data quality control for health planning, health status indexes.

Courses:

- 101 Health Program Planning and Evaluation
- 104 Fundamentals of Data Management for Health Planning
- 107 Information Methods for Health Planning
- 106 Techniques for Evaluating Health Systems
- 108 Quality of Data for Health Planning
- 307 Health Status Indicators and Indexes

Group 2. Data Analysis for Health Planning

Subjects Covered: Statistics for health planning, information methods and evaluation techniques for health planning, statistical methods in health services delivery and administration, comparative analysis of community health care delivery systems.

Courses:

- 104 Fundamentals of Data Management for Health Planning
- 107 Information Methods for Health Planning
- 106 Techniques for Evaluating Health Systems
- 111 Reimbursement and Rate Setting: Concepts, Techniques and Applications
- 305 Forecasting Health Services Utilization
- 306 Statistical Methods in Health Services Delivery and Administration
- 308 Comparative Analysis of Health Care Delivery Systems

Group 3. Evaluation and Cost/Benefit

Subjects Covered: Statistics and information for planning and evaluation of health programs, analysis of statistics on utilization of health services, organization and presentation of cost and expenditure data.

Courses:

- 104 Fundamentals of Data Management for Health Planning
- 107 Information Methods for Health Planning
- 106 Techniques for Evaluating Health Systems
- 117 Data Sources for Estimation of Health Expenditures

ATTENDANCE

COURSE MATERIALS

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ASTI students are exposed to an intensive learning situation; therefore, to insure full benefit from a course, attendance is required at all sessions.

Students who are accepted into a course are requested to reconfirm their intention to participate two weeks before the course begins. Failure to attend a course without notice may preclude the student's subsequent participation in the ASTI program.

At the final class session, students who have attended all sessions and completed assignments, including homework exercises, are given a certificate of completion.

The notebooks distributed for use of students during a course contain materials that are supplementary to the daily lectures and exercises. Course materials are not available for distribution to students who are unable to attend a course.

LOCATION OF COURSES

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In order to make ASTI training accessible to as many prospective students as possible, courses are presented in conveniently located cities on a rotating basis.

Classroom facilities in Federal and State office buildings are used when available; otherwise, classes are conducted in hotel conference rooms.



SCHEDULE OF COURSES

COST

ASTI courses are scheduled by semesters; January-June and July-December. A calendar announcing the schedule and location of courses is issued four months prior to the beginning of each semester (October 1 and March 1). The January-June calendar is printed on the inside cover of this bulletin. Most courses are five days in length, beginning on Monday morning at 8:30 A.M. and ending Friday afternoon.

There are no registration or tuition fees for courses given by ASTI, and all course materials are provided at no cost to the student. Students provide their own transportation, housing, and other living expenses while attending courses. Detailed information about hotel and classroom sites are given in the acceptance letters. Special hotel rates are usually available.

HOW TO APPLY

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Course announcements, including application forms, are mailed out three months before each course. There is also an application form in the center of this bulletin which may be reproduced for additional copies.

To be considered for a course, an application must be submitted. The application form should be filled out carefully to include as much information as possible about the applicant's job description, background, and course expectations. Please type or print with dark ink. Incomplete applications will be returned to the applicant.

All applications are reviewed by the instructor, and students are notified of their acceptance or non-acceptance one month before the course begins. It is not appropriate to send a substitute.

In order to present a course, a minimum class size of 20 is required; however, most ASTI courses are oversubscribed. Therefore, it is important to submit applications at least six weeks prior to the course. If you do not receive an acknowledgement of your application within two weeks, please call the ASTI office (telephone 301-436-7047) to make sure your application has been received.

MAILING LIST

To be placed on the mailing list to receive announcements of ASTI courses, send your request to the Applied Statistics Training Institute (address below). Your help in avoiding unnecessary duplication of mailings to the same agency will be appreciated. To request changes or deletions, please enclose a copy of the current mailing label.

Processing time for mailing list additions or corrections is approximately 6-8 weeks.

For further information, write or call:

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COURSE DESCRIPTIONS

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COURSE NO. 100.
Management of Health Data

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Objectives: This course is designed to familiarize the student with the fundamental processes of health data management, from the conceptualization of the problem to its resolution. Specifically, participants will learn to:

- define appropriate study populations
- design coding formats for questionnaires
- describe edit procedures, consistency checks, and imputation methods for machine processing
- construct table shells for data presentation

Course Description: This introductory course provides instruction in health problem data management emphasizing such fundamental concepts as: defining the scope of the problem; developing an appropriate data base; coding structures for questionnaire response; preparing the data for machine processing; and describing appropriate statistical outputs. Topics include:

- *Development of a Statistical Study*
Plans and objectives of the study
Management strategies
Translation from concepts to measures
- *Classification*
Standard classification systems
Sources for classification systems
- *Coding*
Development of coding specifications
- Coding items on model study questionnaires
- *Quality Control*
Field collection
Editing
Imputation
- *Development of Final Data Output*
Types of computer tabulations
Specifications for data processing
Development of final tabulations

Through lectures, practical workshops, and use of instructor and student studies, participants will get practical experience in the planning and production of a statistical study.

Target Audience: Managerial and administrative personnel at the local, State or regional level involved in, or responsible for, developing operational plans for the collection, processing and presentation of data concerning a specific health problem.

Prerequisites: Managerial or administrative responsibility for applied health data management and problem solving. Some knowledge of the capabilities of electronic data processing equipment would be helpful.

Length of Course: 4½ days

Director: Charles Croner

COURSE NO. 101**Health Program Planning and Evaluation**

21

Objectives: Orderly management of an extensive health program depends upon a rational process of planning, feedback, evaluation, and redesign. Central to this mechanism is the ability to conceptualize performance and outcomes of health services in quantifiable terms. Participants in this course will be exposed to information and ideas which will permit them to:

- distinguish between issues and problems and use community resources to elicit information on high priority concerns and specific health problems
- identify data requirements for optimum intervention strategies
- set goals and milestones to achieve defined outcomes through practical exercises with data from a reference community
- evaluate program achievement through an iterative process
- use new skills in the use of data (indexes) for program planning and evaluation

Course Description: This course examines the principles and methods of planning and evaluation as applied to public health programs and health data systems. Topics covered include:

- *Defining the Problem*
Issues vs. problems
Dimensions of effective problem definition (measures of incidence and prevalence of morbidity and disability; mortality; urgency; timeliness)
Establishment of relative priority
- *Data Requirements for Effective Problem Definition*
Information sources (current data, Cooperative Health Statistics System, indexes)
Choosing optimum intervention strategies (cost benefit/cost effectiveness methods, numerical ranking, measurement tools related to choices)
- *Evaluation of Program Achievement*
Iterative cycle
Decision paths
- *Goal Setting*
Statement of missions
Goals and sub-goals; mid-range milestones
Objectives and sub-objectives quantified and related to outcomes
Constraints (physical, legal, financial, consumer reaction)
Values of goals and objectives- criteria for achievement

Formal lectures provide the background for practical workshops using a complete set of demographic, health, social, and political data of a reference community, the Dixon-Tiller Community.

Target Audience: Managers, planners, and administrators of comprehensive health services programs.

Prerequisites: College education or equivalent; experience in statistical consultation to managers of health programs; or responsibility for management and evaluation of health programs.

Length of Course: 4½ days

Director: Robert Mytinger

COURSE NO. 103.**Research Methods in Evaluation of Health Programs**

22

Objectives: This course is intended to develop an understanding of the fundamental principles of health services research and evaluation methods. Through this course, the student will learn proper methods and techniques for planning research so that the results can be evaluated in a quantifiable way. The student will learn to:

- construct hypotheses relating to behavior in a health services setting
- select experimental designs based upon the goals of a study and the nature of the measurements
- construct indexes, scales, and units of measure which are both valid and reliable
- draw up dummy tables and select the best statistical test of hypothesis
- write a complete research protocol

Course Description: This course is centered around the construction of a research protocol and requires considerable pre-class work by each student. Study materials and reading assignments are distributed at the time of registration. The following subjects are discussed:

- *Goals of research derived from social science principles and applied to health services problems*
- *Types of research studies applicable to Social Sciences*
- *Statement of the Problem*
 - Primary outcome quantification
 - Alternative etiological concepts
 - Statement of null or alternate hypothesis in terms of dependent variable and alternate independent variables
- *Research Design*
 - Levels
 - Units and levels of measurement
 - Validity and reliability
 - *Evaluative Research*
 - Procedures
 - Administrative problems
 - Data collection using available data vs. collecting data from primary sources
 - *Implementing Research Plans*
 - Sampling
 - Analysis and interpretation
 - Logistics and data processing

Laboratory sessions include discussion of "model" protocols, further efforts at protocol construction, and finally, presentation of final protocols. Tutorial sessions are held with the instructor outside of class hours.

Target Audience: Health services research project directors, health planners, and others engaged in similar activities.

Prerequisites: Bachelor's degree plus some graduate study or equivalent, with some knowledge or familiarity with health services research. The student is required to prepare an initial draft of an original protocol before classes begin, with a final version to be developed during the course.

Length of Course: 8 class days

Director: Monroe Lerner

COURSE NO. 104.**Fundamentals of Data Management for Health Planning**

23

Objectives: In response to planning legislation. "The National Health Planning and Resources Development Act of 1974" (PL 93-641), this course focuses on identification, collection, and utilization of statistical information required for planning, development, and regulation of health care delivery systems. Participants will:

- identify and interpret those sections of PL 93-641 relating to health statistics and their use in planning and managing a health services system
- practice the skills required to set up a data management scheme
- identify factors which determine planning priorities
- evaluate sources and limitations of data presently available for health planning
- distinguish differences in organization and operation of health data management systems at Federal, State, and local levels

Course Description: Through a combination of lectures, small group exercises, plenary session discussions, and exposure to pertinent literature, the course covers the basic aspects of health data systems. Topics include:

- *Data Requirements of the Health Systems Agencies and State Health Planning and Development Agencies under PL 93-641*
 - Functions of a Health Systems Agency (HSA): planning, developmental, regulatory
 - Time line for performing functions
 - Mandated data responsibilities for HSA's and State Agencies
 - Data activities identified in proposed rulemaking for HSA's
- *Statistics and Health Care Data Management in Health Planning*
 - The statistical process (collection, classification, analysis, interpretation, and utilization of numerical facts)
 - Factors which determine planning priorities
- *Sources and Utilization of Statistics and Information in Health Planning*
 - Demographic and socio-economic data
 - Health status statistics
 - Health services and resources statistics
 - Environmental health planning statistics
 - Commonly used rates and ratios in health planning
- *Special Data Needs for Health Planning*
 - Health Status Indicators
 - Status of Health Care Delivery Systems
 - Influence of Health Care System on Health Status
- *Federal, State, and Local Activities in Data Management for Health Planning*

Target Audience: Health planners and analysts employed as staff of Health Systems Agencies, and State Health Planning and Development Agencies. This is not a course for statisticians or those involved in data processing and statistical research.

Prerequisites: General knowledge and understanding of the legislation, organization, and operation of health planning organizations as created by P.L. 93-641. No knowledge of biostatistical theory or practice is assumed.

Length of Course: 4½ days

Director: Charles Cameron

COURSE NO. 106.**Techniques for Evaluating Health Systems**

24

Objectives: This course addresses the issue of diagnosing a community's health services delivery system. In particular, at completion of this training the participant will be able to:

- specify goals and objectives in quantitative terms
- define and measure key parameters of health outcomes
- define and measure key parameters of process and structure of the health system
- evaluate the weaknesses and strengths of specific designs for measuring the impact of the health system

Course Description: This course provides coverage of fundamental concepts of evaluating the impact of the health delivery system on the health status of the community. Topics included are:

- *An Overview of Systems Planning*
- *An Overview of the Evaluation Process*
 - The purpose and use of evaluation
 - Evaluation criteria
 - Inputs to the health system
 - Evaluation design alternatives
 - Cause and effect vs. association
- *Techniques Useful in Evaluation Analysis*
 - Modeling
 - Simple regression
 - Cost benefit/cost effectiveness
 - Technology assessment
 - Health indexing
- *Management of the Evaluation Process*
- *Data for Evaluation*

Target Audience: Health planners and analysts with responsibility for evaluating the impact of health systems on the community. Please note that this course addresses the community level of evaluation and not the program level. This course may not be suited for individuals interested in program evaluation.

Prerequisites: Basic knowledge of PL 93-641 and some basic knowledge of statistics

Length of Course: 4½ days

Director: David Bergwall

COURSE NO. 107.**Information Methods for Health Planning**

25

Objectives: Health planning is a process which includes plan development, plan implementation, and evaluation of the effects of implementation. The successful performance of each of these functions depends very heavily upon the presentation of appropriate information to decisionmakers. Consequently, this course is designed to teach participants to:

- utilize health data and health-related data in the health planning process
- identify sources and basic uses of data related to:
 - community characteristics
 - health status
 - health services utilization
 - health resources
- apply techniques which will be generally useful in analyzing data for health planning decisions

Course Description: This course provides basic level training and practice in collecting, organizing, and presenting quantitative health information for input into health planning decisions. Subjects covered are:

- *Information systems, including structure of records and files*
- *Utilization data: sources and analyses, including patient origin studies*
- *Resources inventories and use of computers in analyzing health data*
- *Health status data*
- *Data for community descriptions*
- *Techniques of using data, including forecasting, modeling, and projection of need*

Target Audience: Health planners and administrators with responsibility for preparing data for health planning decisions. This course is designed for persons whose education, training, or experience has not been focused primarily on health information systems.

Prerequisites: Knowledge of PL 93-641 and some experience with community-wide health planning. The course is designed for persons who have had less than one year's experience in either systems planning and/or data management.

Length of Course: 4½ days

Director: Philip Reeves

COURSE NO. 108.**Quality of Data for Health Planning**

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Objectives: Successful health planning depends upon the availability of pertinent data. The confidence with which data can be used depends upon the quality of the data and ability to assess the limitations of the data. Accordingly, the course is designed to develop understanding and skills needed to:

- determine the quality and limitations of data collected from either primary or secondary sources
- apply appropriate adjustment techniques and certain defensive methods in order to draw the most meaningful conclusions

Course Description: This course treats quality of data in terms that are relative to the purposes to be served by the data. It presents methods for determining relevant quality of data, for improving effective quality, and for coping with residual quality deficiencies in order to improve the usefulness of available information. Topics covered include:

- *Identification of Issues*
 - Relationship of quality to purpose
 - Necessary quality levels
 - Inherent inaccuracies in data
 - Problems of selectivity and bias
 - Problems of nonresponse
 - Processing error
- *Collection of Data from Primary Sources*
 - Choice of source and method of collection
 - Concepts, definitions, classification, coding
 - Sampling as a primary technique and as an audit device
- *Assembly of Data from Secondary Sources*
 - Adaptation of principles of direct collection to secondary sources
 - Understanding the secondary source
- *Defensive Statistical Methods*
 - Editing techniques
 - Control devices
 - Selection of most robust alternative
 - Minimizing bias

Lectures will be supplemented with illustrative examples and workshop exercises. Participants may introduce topics for group discussion.

Target Audience: Users of health data for planning at State and local levels.

Prerequisites: Participants should have a working knowledge of quantitative methods or statistics and experience in the use of health related data for statistical analyses.

Length of Course: 4½ days

Director: James O'Brien

COURSE NO. 111**Reimbursement and Rate Setting: Concepts, Techniques and Applications**

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Objectives: Since expenditures for health services are now over \$100 billion annually, it is important to understand the nature of factors which affect cost containment and quality of care. Rate setting and reimbursement practices are essential tools for bringing good management principles to the delivery of health services. This course is designed to develop knowledge and skill to:

- define and establish data sets and analytical systems for setting rates for services
- distinguish between the various regulation processes followed by hospitals, commercial insurers, and Blue Cross/Blue Shield
- describe existing procedures and concepts of costs and cost containment
- specify the mechanisms of reimbursement and the effect of incentives and negotiation

Course Description: This course examines the critical aspects of rate setting and reimbursement for health services in terms of data sets and systems analysis. Current practices are examined and evaluated. Topics include:

- *Rate Setting and Reimbursement*
Definitions
The rate setting process
Data sets and budget information
Quantitative techniques
Implementing data bases and analytical systems
- *The Regulation Process*
Regulation by hospitals, commercial insurers, and Blue Cross/Blue Shield
Proposed national health insurance programs
Resource allocation: community and institutional perspectives
Regulation and control by internal management
- *Costs and Cost Containment*
Procedures and concepts
Means of cost containment used by insurance organizations, communities, and institutions
- *Reimbursement*
Mechanisms
Effect of incentives and negotiation
Examples of reimbursement systems
- *Rate Setting*
Practices and objectives
Steps in rate setting process
Identification of cost centers

Prerequisites: Responsibility for fiscal, accounting and regulatory functions in health services settings.

Target Audience: Managers, administrators, finance officers, and regulators of programs involving delivery of health services.

Length of Course: 4½ days

Director: Jay H. Glasser, Ph.D.

- Objectives:** Where there is a need for basic health information, it is helpful to use existing sources of information if they can be made to serve the intended purpose.
- 2: This course provides insight into data systems on demographics, health status, utilization of health resources, and expenditures for health care. The student should then be able to:

- define the necessary characteristics of a data system which makes it useful for the specific problem
- identify major national data sources
- evaluate the utility of a data source for the intended application
- utilize techniques for reconciling data sets which are organized in varying formats

Course Description: This course is designed to assist users of health data to define data needs; obtain data from existing sources; and evaluate the utility of the information for specific purposes. The emphasis is on methods for obtaining and using data on demographics, health status, utilization of health resources, and health care expenditures. Specific topics include:

- *Defining Data Needs*
 - Frequently encountered data problems
 - Formulating the data question
 - Types of available data
 - Developing a strategy for obtaining data
- *Identifying Data Sources*
 - The major national health data collectors
- National data sources
- Future sources of health data
- *Evaluating a Data Source*
 - Basic quality issues
 - Errors associated with special sources
 - Terminology
 - Assessing national data sets
- *Methods for Obtaining Data in Different Formats*

This course makes use of problem-solving group and individual exercises. Examples will draw on major national data bases.

Prerequisites: Applicants should have responsibility for collecting and analyzing data from various sources in order to highlight State and local health problems.

Target Audience: Statistical analysts, planners, administrators, or managers of State and local health programs.

Length of Course: 4½ days

Director: Bonnie L. Owen

Return Address

Zip Code _____

PLACE
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APPLIED STATISTICS TRAINING INSTITUTE
NATIONAL CENTER FOR HEALTH STATISTICS
CENTER BUILDING ROOM 2-28
3700 EAST WEST HIGHWAY
HYATTSVILLE, MARYLAND 20782

APPLIED STATISTICS TRAINING IN

1. NAME OF APPLICANT: (Please type or print)

(last) (first) (middle initial)

2. COURSE DESIRED: No. _____ Date _____

Title _____

Location _____

3. PREVIOUS ASTI COURSES ATTENDED (Titles and Dates)

4. SPONSOR OR EMPLOYER:

Name of
Organization _____

Local Address _____

City and State _____

Zip Code _____ Office phone _____
(Area Code and number)

5. PROFESSIONAL STATUS:

Occupation _____

Job Title _____

Brief description of your present job _____

INSTITUTE APPLICATION

EDUCATION:

High School _____ College _____
year graduated highest degree and year

Major(s) _____

PROFESSIONAL EXPERIENCE:

Total years _____

HOW DO YOU EXPECT THIS COURSE TO BENEFIT YOU PERSONALLY?

WHAT JOB-RELATED BENEFITS DO YOU EXPECT FROM THIS COURSE?

Section 304(b)(1) of the PHS Act (42 USC 242b) authorizes the DHEW Secretary to provide technical assistance in matters relating to health statistical activities. The principal purposes of the information requested in this form are to select students for ASTI courses and to perform statistical analyses on student data. This information may be disclosed in confidence to contractors and instructors who are bound by the Privacy Act of 1974 (5 USC 552a). Provision of the requested information is voluntary; however, failure to supply all information may delay or prevent action on your application. Voluntary disclosure of information after being informed of the routine uses and disclosures described above is an acknowledgement of consent to such uses and disclosures.

Signature of applicant

Home phone

Signature of supervisor

Date

COURSE NO. 115.**Statistical Systems for Mental Health Centers**

29

Objectives: Operating under the premise that people and services ought to be related, this course focuses on systems for generating information on mental health services. Particular emphasis is placed on relating clinical data to cost of services with favorable patient outcomes as the primary goal. Specifically, participants will develop the skills to:

- Design and implement client-oriented cost/outcome systems
- Establish systems of quality assurance procedures which integrate client outcomes with management decision-making (clinical and fiscal)
- Identify minimal data summaries in support of organizational decision structures
- Execute cost-finding and rate-setting procedures

Course Description: This course is designed to provide a basic understanding of the utilization of client data and costs of services for planning, monitoring, and evaluating community mental health programs. Topics covered include:

- *Client-oriented Cost/Outcome Systems*
From client flow to quality assurance
Organizational system relations and decision structures
- *Synthesis of client data for service management*
Format of intake and service-rendered document
Format of data summaries
Development of clinical record for quality assurance
- *Cost Finding and Rate Setting*
Staff time and activity allocation
Cost outcome and program analysis
- *Cost Effectiveness and Evaluation Research*
Cost effectiveness
Planning evaluation research
Reliability measures of clinical processes
- *Implementing a Management Information System (MIS)*
Computer systems design
Computerized vs. manual information systems
Development and implementation of an MIS in a Community Mental Health Center

This course makes extensive use of problem-solving exercises and group-oriented discussions.

Target Audience: Clinicians, administrators, or managers of comprehensive mental health services organizations.

Prerequisites: Applicants should have responsibility for or involvement with planning, control, and evaluation of community mental health programs.

Length of Course: 4½ days

Director: Frederick Newman

COURSE NO. 117.**Data Sources for Estimation of Health Expenditures**

30

Objectives: To train health planners to identify data sources and estimate expenditure (public vs. private) for health services, and to allocate funds by functions. Specifically, the student will learn how to prepare, organize, and present cost data for health services on the state level. Special problems involving substate areas are not noted.

Course Description: This course provides an introduction to methods for estimating and analyzing expenditures for health services and health programs. Subjects covered are:

- | | |
|--|--|
| • <i>Conceptual aspects</i>
Definition of health services
Classification of services
Sources of funds for analysis | Public (Medicare, Medicaid, Workmen's Compensation, State-Federal programs, Federal health programs, Categorical programs) |
| • <i>Alternative sources of data for estimating expenditures for health services</i> | • <i>Organization of cost and expenditure data for clarity and comparability prior to analysis</i> |
| • <i>Sources of funds for health services:</i>
Private (direct payments, out-of-pocket, insurance benefits, philanthropy) | • <i>Limitations and extensions for data analysis</i> |

Sessions consist of lectures, discussions, and workshops.

Target Audience: Planners and administrators of community health programs.

Prerequisites: Knowledge of planning, budgeting, and presentation of fiscal data.

Length of Course: 4½ days

Director: Harvey Zimmerman

COURSE NO. 200.**Vital Statistics: Measurement and Utilization**

31

Objectives: An essential prerequisite for interpreting the relationship between health resources and health status is a knowledge of vital events underlying the changing characteristics of a population. This course explores the fundamental characteristics of measures of vital events and their potential use in generating health intelligence for health planning and other uses. Participants will be shown how to:

- define and generate measures of vital events
- determine the quality of data collected from vital records
- construct statistical indicators which relate to health planning
- correlate statistics on vital events with other relevant data, i.e., utilization of health resources

Course Description: This course covers topics relating to sources and principles of generating measures of vital events; factors affecting the quality of demographic data; and illustrative examples of utilization of vital statistics as a part of health planning. Specific topics include:

- *Measures of Vital Events (Mortality, Natality, Marriage, Divorce)*
 - Definition of terms
 - Computation of summary figures (rates, ratios, proportions)
 - Analysis and interpretation of measures of vital events
 - Factors affecting the quality of demographic data
- *Survey of Applications of Vital Statistics*
 - National and State levels
 - Data needs for health planning
 - Uses of vital statistics as a part of a health plan
 - Identification of health problems
 - Utilization of health services
 - Combining data from other sources

Formal lectures are supplemented by seminars and workshop sessions which provide "hands-on" experience.

Target Audience: Personnel experienced in using vital statistics or involved with the data portion of health planning.

Prerequisites: Knowledge of concepts, underlying rates, ratios, proportions, and population at risk.

Length of Course: 4½ days

Director: John Patterson

COURSE NO. 202.**Vital Statistics Records and Their Administration**

32

Objectives: Proper management and administration of a vital statistics record system is a prerequisite for maintaining and using vital statistics at national and subnational levels. This course emphasizes the rationale for existing recommended national procedures relating to vital registration systems. The participant will learn to:

- | | |
|---|--|
| • apply recommended national procedures | establish uniformity and standardization |
| • identify when specific data items should be edited, followed up by query, and corrected | • review and revise a State Vital Statistics Act to conform with the model |
| • set up control systems to reduce fraud, protect confidentiality, and | • evaluate current procedures in comparison to other areas |

Course Description: Course material is derived from actual experience and topics include:

- | | |
|--|---|
| • <i>Background History of the U.S. Vital Registration System</i> | Maintenance of a records system and guidelines for storage and retrieval |
| • <i>Techniques and Procedures of a Vital Registration System</i>
Standards for collecting, editing, querying, and completing records
Managing a vital records information system
Certification and verification procedures | • <i>Special Problems</i>
Protecting confidentiality of vital records
Detecting and controlling fraudulent use of vital records
Interaction with the public
Legislative and regulatory policies relating to vital records |

Target Audience: Local, State, and Federal personnel involved with vital registration.

Prerequisites: Experience in, or responsibility for, a State or local vital registration program or a Federal, State or local program related to the vital registration system.

Length of Course: 4½ days

Director: George Gay

COURSE NO. 216.
Family Planning Statistics

33

Objectives: This course is directed toward the development of an understanding of the issues, knowledge base, skills, and activities required for effective planning and evaluation of family planning programs in the U.S. Materials will be presented to meet the needs of local program managers as well as those whose responsibilities cover larger geographic areas such as states and regions. Specifically, the participants in the course will learn to:

- identify types of statistical data required for planning and evaluation of family planning programs and sources from which such data can be extracted
- manipulate statistical data to produce indicators used in program evaluation
- interpret and analyze indicator values in the context of decisionmaking

Course Description: Course material will be presented in a workbook containing a detailed outline, illustrative charts and tables, selected readings and exercises. Topics included are:

- *Conceptual framework for developing evaluation methodology*
Overview of family planning programs in the U.S.: background and current status
Evaluation for short-term program planning and administrative purposes
Evaluation through measurement of long-term impact of family planning program
Data: sources, uses, and criteria
Inventory of critical program decisions
- *Measurement for evaluation*
- Program indicators: target population, services statistics, cost, and manpower studies
Fertility research: findings from National Survey of Family Growth; Johns Hopkins studies of Adolescent Sexuality, Contraception and Pregnancy
Construction, definition, and uses of fertility indicators
- *Analysis of indicators and research findings and application to the development of an Evaluation Plan*

Target Audience: Planners, managers, and administrators of family planning programs.

Prerequisites: Program responsibility for management or administration of a family planning service.

Length of Course: 4½ days

Director: Joy Dryfoos

COURSE NO. 222.
Microfilm for Vital Records

34

Objectives: This course is designed to provide a working knowledge of the principles of microfilm/micrographics and computer technology to increase the efficiency of handling records of vital events. Specifically, participants will develop the knowledge and skill to:

- determine the advantages and disadvantages of microfilm for use in specific applications
- select the type of microform to use for specific jobs
- specify types of indexes for the various microforms
- diagram flow charts for an existing or new system
- write quality control specifications for micrographics
- use computer-output microfilm
- differentiate among types of updating systems
- operate various types of equipment

Course Description: This course combines an introduction to the use of computer-output-microfilm with an in-depth evaluation of existing principles for selection and design of a microfilm system. Subjects covered include:

- *Advantages and disadvantages of using microfilm*
- *Specific microforms and their use (16mm and 35mm rolls, cartridges/magazines/cassettes, microfiches, jackets, etc.)*
- *Indexing for retrieval, given the particular microform(s)*
- *Information flow before, and after, implementation of a microfilm system*
- *Work flow under a microfilm system (document preparation, filming, processing, duplication of film, quality control, and updating procedures)*
- *Standards and compatibility of microforms*
- *COM (Computer-Output-Microfilm) and its present and future impact*
- *Future trends and possible impact upon current system (higher reduction ratios, color, computer interface, retrieval, scanning of microfilm for computer input)*
- *Demonstration and review of various manufacturer's equipment*

Lectures, discussions, and problem-solving sessions (laboratory) are utilized to acquaint participants with current practices.

Target Audience: State, local, and other workers in the field of vital records who are planning a microfilm program or wish to improve their existing microfilm system.

Prerequisites: Some knowledge of microfilm systems that could be applied to the Vital Records area.

Length of Course: 3 days

Director: B. Doudnikoff

COURSE NO. 231.**Perinatal and Infant Health: Morbidity and Mortality Analysis**

35

Objectives: This course addresses methods for applying basic statistical principles to data on perinatal and infant mortality and morbidity. The participant will learn to:

- identify the organized body of statistical information on mortality and morbidity from the time of conception to one year of age
- apply basic statistical principles to the field of perinatal and infant mortality and morbidity
- organize and present the basic components of information in this field.

Course Description: This course covers the period from conception to the age of one year, and describes sources for data on vital events for this interval. Subjects covered are:

- *Methods of Data Collection*
 - Registration and vital records
 - Case reports
 - Case registers
 - Program statistics
 - Surveys
 - Special studies
 - *Definitions and classifications*
 - Births, deaths, and fetal deaths
 - Calculation of gestation
 - Classification of fetal development,
- e.g., weight and/or gestation
Classification of causes of death
- *Principles of tabulation*
 - *Analysis*
 - Rates and ratios
 - Adjustment of rates for various factors
 - Life table techniques
 - Regression and correlation

Sessions include lectures, discussions, and practical laboratory work dealing with the material covered in the lectures.

Target Audience: Registrars, statisticians working with vital statistics, and researchers interested in perinatal and infant health problems

Prerequisites: Participants should have some experience with the preparation, analysis, and presentation of statistical information.

Length of Course: 4½ days

Director: Helen Chase

COURSE NO. 233.**Epidemiological Methods for Planning and Management of Health Programs**

36

Objectives: Descriptive epidemiology is a science which provides the tools for analyzing and interpreting the occurrence and course of a disease in a population. Management and evaluation of chronic disease control programs can be assisted through use of descriptive epidemiological techniques. Participants in this course develop the skills to:

- identify and control bias in collection and analysis of data on chronic disease
- select and use appropriate summarizing rates (incidence, prevalence) for describing chronic disease states
- make comparisons of the impact of chronic disease on populations over time and for different geographic locations
- utilize cohort analysis, surveillance and screening programs, and retrospective and prospective surveys correctly for management and evaluation of chronic disease control programs
- apply survivorship follow-up life table techniques for evaluation of control programs for chronic diseases

Course Description: Each lecture is followed by practical problem sessions to provide practice in statistical techniques and subsequent interpretation of results. Topics include:

- *Control of Bias*
Use of cross-classification or standardization to control potential bias in data
Adverse consequences of failing to control bias
- *Summarizing Descriptors for Disease States*
Incidence and prevalence rates: adequacies and inadequacies
Relationship between incidence and prevalence rates
Attack rates and relapse rates: how used and interpreted
- *Identification of Existence of Health Problems*
Changes over time and from place to place
- *Data-Based Control Programs of Chronic Diseases*
Hypertension
Diabetes
Cancer
Coronary heart disease

Target Audience: Persons who analyze or use data on chronic disease.

Prerequisites: A one-semester course in college statistics, and a good knowledge of high school algebra.

Length of Course: 4½ days

Director: Colin White

COURSE NO. 300.
Statistical Methods in Public Health I

37

Objectives: This introductory course is intended to provide a working knowledge of elementary statistical tools. Specifically, participants will develop the knowledge and skill to:

- draw a random sample
- compute and interpret measures of central tendency and dispersion
- construct and interpret confidence intervals for a mean, a rate, and a standard deviation
- test hypotheses about a mean, a rate, homogeneity, independence, and goodness of fit
- construct and interpret a correlation coefficient

Course Description: This course combines lectures, discussions, and laboratory (i.e., problem-solving) sessions. Primary emphasis is on descriptive statistics and the basic ideas of estimation and hypothesis testing, including an introduction to the analysis of contingency tables. Subjects covered include:

- *Sampling*
- *Measures of central tendency and dispersion*
- *Graphical descriptive statistics*
- *Probability and patterns of chance*
- *Confidence intervals*
- *Hypothesis testing*
- *Chi-square tests for association and goodness-of-fit*
- *Introduction to regression and correlation*

Target Audience: State, local, and other workers in the fields of vital, health, and medical statistics who have little formal training in statistics or who might benefit from a refresher course.

Prerequisites: College algebra, ability to manipulate mathematical symbols and formulae.

Length of Course: 4¾ days

Director: Dwight Brock

COURSE NO. 301.
Statistical Methods in Public Health II

38

Objectives: This course is designed to provide the student with skill to use statistical tools dealing with two-sample analyses, correlation, regression, and analysis of variance. Participants will develop the knowledge and skill to construct confidence intervals, test hypotheses, and make interpretations from data requiring the above methods of analysis.

Course Description: This is a continuation of ASTI Course No. 300. After a brief review of the basic concepts of estimation and hypothesis testing, the following topics will be covered by way of lectures, discussions, and laboratory (i.e., problem-solving) sessions:

- | | |
|--|--|
| • <i>Review of Statistical Inference</i>
Probability, random variables, distributions, population parameters vs. sample statistics
One-sample analysis | Two-way ANOVA
Experimental design considerations |
| • <i>Two-sample Analysis: comparisons of means, variances, and proportions</i> | • <i>Regression and Correlation Analysis</i>
Straight line regression-basic problem, assumptions, least squares solution
Correlation and its relationship to regression
Use of large-scale computer in conversational mode
Inferences in regression and correlation
Lack of fit in regression
Introduction to multiple regression
Introduction to non-linear regression |
| • <i>Introduction to Multivariate Techniques: Examples</i> | |
| • <i>Multi-dimensional Sample Analysis</i>
Differences among k proportions
Differences among k means (one-way analysis of variance [ANOVA]) | |

Target Audience: State, local, and other workers in the fields of vital, health, and medical statistics.

Prerequisites: ASTI Course No. 300 or a first course in statistics.

Length of Course: 4½ days

Director: John Fertig

COURSE NO. 302.**Estimating Parameters From Sample Surveys**

39

Objectives: Measures of health status are generally derived from a sampling process. This course emphasizes the application of practical sampling techniques. The participants will learn to:

- construct sampling frames
- determine sample size
- select sample units
- derive estimates from simple and complex sample designs

Course Description: This course provides instruction in the implementation of modern sampling methods for health surveys and special investigations. Sampling methods for household and telephone surveys are emphasized. Random, systematic, stratified, cluster, and multistage sampling schemes are described. Specific topics include:

- *Survey Frames*
 - List surveys
 - Area surveys
 - Telephone surveys
- *Selection of Sample Units*
 - Simple random and stratified random samples
 - Cluster samples
 - Complex sampling designs
- *Estimation Techniques*
 - Simple random and stratified random sample estimates
 - Techniques to adjust for non-response
 - General probability estimators
 - Variance estimation for complex designs

Lectures are supplemented by working sessions which emphasize stratification of the target population, the effects of clustering, drawing samples, and calculating estimates and variance estimates for various sample designs.

Target Audience: Persons who are responsible for planning and implementation of health data collection programs.

Prerequisites: At least six hours of statistics at the university level; experience in working with vital and health statistics.

Length of Course: 4½ days

Director: Robert Casady

COURSE NO. 303.
Health Survey Methods and Procedures

40

Objectives: Health surveys are often used to obtain data required to meet specific objectives. This course focuses on benefits and problems associated with surveys. Participants will learn to:

- describe the essential elements of a survey
- design a data collection instrument
- specify quality control procedures
- describe the steps necessary to prepare data for processing

Course Description: This course, which consists of lectures, workshops, and laboratories, draws examples from State and national health surveys. Students are asked to submit samples of questionnaires and other materials they have designed and used in population surveys for discussion in class. The course considers face-to-face interview surveys, telephone interview surveys, and mail questionnaire surveys, with emphasis on population surveys by telephone and mail. Specific topics include:

- *Why do you need a survey?*
 - What are the questions?
 - Who are the data users?
 - Statement of objectives.
 - What can be collected?
 - How should it be collected?
- *Planning a questionnaire*
 - Types of questionnaires
 - Design of questionnaires
 - Pretesting and pilot studies
- *Planning a local health area survey*

Target Audience: Health planners, survey statisticians, program managers

Prerequisites: Knowledge and use of health statistics and current or future plans for conducting or sponsoring population surveys.

Length of Course: 4½ days

Director: Joseph Fitti

COURSE NO. 304.**Life Table Methods in Health and Mental Programs**

41

Objectives: The life table method is a statistical tool relevant to health and mental health, demographic, and socio-economic studies. This course focuses on principles and methods for constructing a variety of life tables and how to execute statistical tests of significance on life table functions. The participant will learn to:

- construct complete and abridged standard life tables based upon the concept of a stationary population
- generate survivorship tables which incorporate multiple decrements and reflect socio-economic factors
- build cohort life tables for specific purposes, including mental health data
- interpret tests of significance in the context of public health and mental health problems

Course Description: This course is a combination of lectures and laboratory sessions in which life tables are constructed under the supervision of the instructor. Specifically, the following subjects are covered:

- *Types and Sources of Life Tables*
 - Anatomy of a current life table
 - Construction of a complete life table
 - Construction of abridged life tables
- *Special Applications of Life Table Techniques*
 - Multiple decrement tables (nuptiality, working-life, school-life)
 - Cohort life tables—used in health and mental health programs
- *Sample Variance and Tests of Significance of Life Table Functions*
 - Techniques for handling “withdrawals alive” and “lost to follow-up”
 - Sample variance of proportions in the interval
 - Test of significance between proportions
 - Differences in duration expectancies

Target Audience: Program managers, health and mental health data analysts, and program planners and evaluators.

Prerequisites: A working knowledge of elementary statistics and basic mathematics.

Length of Course: 4½ days

Director: Jan Kuzma

COURSE NO. 305**Forecasting Utilization of Health Services**

42

Objectives: The science of forecasting provides a useful tool for rational management of health resources. This course examines forecasting techniques and, through example, illustrates applications to use of manpower, facilities, and funds in the delivery of health services. The student will be taught how to:

- list the required inputs for making forecasts of demand for health services
- apply specific techniques of forecasting (trend, auto-regression, correlation, multi-factor, change factor, Delphi, sensitivity analysis, market and demand variability, and dependence analysis) to given sets of data
- distinguish between various techniques of forecasting and the specific kinds of data which determine the appropriate technique to use

Course Description: Forecasting future utilization of health services provides a rational basis for planning intervention strategies which impact on cash flow, capital expenditures, operating budget and allocation of manpower. When the purpose of a forecast is precisely defined, the particular technique to be used is determined. This course addresses the characteristics and limitations of various approaches to forecasting. Topics include:

- *Introduction to forecasting the utilization of health services*
 - Uses of forecasts
 - Critical factors in defining the purpose
 - Inputs to forecasts
 - *Techniques of Forecasting*
 - Trend
- | |
|-------------------------------|
| Auto regression |
| Correlation |
| Multi-factor |
| Change factor |
| Delphi |
| Sensitivity analysis |
| Market and demand variability |
| Dependence analysis |

Prerequisites: Responsibility for generating forecasts as a basis for management decisions relating to health services delivery systems. Knowledge of statistical methods (Analysis of Variance, Regression, and Probability Distributions) required.

Target Audience: Statisticians, analysts, and managers of health services programs.

Length of Course: 4½ days

Director: R. Scott MacStrivic, Ph.D.

COURSE NO. 306.**Statistical Methods in Health Services Delivery and Administration**

43

Objective: Health delivery issues are complex. Health systems planners and managers can benefit from an understanding of the basic principles and applications of statistical methods. The participant in this course will develop the knowledge to:

- define the issues in health services systems and their quantitative dimensions
- identify the components of health information systems and generate relevant data
- apply statistical concepts of sampling, sampling design, measurement of error, and statement of hypotheses in relation to epidemiological analysis
- use selected analytical procedures (multiple variable analysis, data reduction, and operations research)

Course Description: This course treats the health services system holistically—from its concepts and issues to evaluation of impacts and efficiency. The topics include:

- *Current issues in health services*
The medical care concept
Quantitative dimensions of health services
Innovations in health care delivery
The planning process
- *Health information systems*
Comparison of types of information systems
Components of health information systems
Flow diagrams of services and concomitant health data systems
- *Statistical concepts and epidemiological analysis*
- Construction of health indices
Methods of analysis: measures of association, regression, stochastic models, data reduction techniques
Prospective, cross-sectional, and retrospective study designs
Sampling designs
Operations research
- *Experimental design and evaluation*
Use of experimental designs
The evaluation process
Cost-benefit analysis
Applications of the evaluation process

These areas are examined solely in the context of health service systems. The course includes lectures, informal discussion, and workshop sessions. Instructional materials and reading references are provided.

Target Audience: Health professionals who use, produce, or analyze health services data.

Prerequisites: Knowledge of mathematics or statistics or experience in working with statistics. Familiarity with descriptive statistics is required.

Length of Course: 4½ days

Director: Jay Glasser

COURSE NO. 307.
Health Status Indicators and Indexes

44

Objectives: Evaluation is an essential ingredient of any well-managed health services program. This course provides an overview of the quantitative techniques (health status indicators and indexes) most useful for measuring the impact of a health program on a reference population. Specifically, students in this course will learn to:

- state the relationship of health status indicators and indexes to health status goals and objectives
- distinguish between types of health status indexes and indicators
- develop and use health status indicators and indexes for evaluation of a hypothetical health services program
- execute specific algorithms for analysis of measures of health status.

Course Description: Formal lectures, discussions, and workshops will be integrated with practical exercises covering health status measurement and analysis. Topics covered include:

- | | |
|---|--|
| <ul style="list-style-type: none"> • <i>Statement of the Problems</i>
 Concepts of Health (WHO, Holistic, and Wellness)
 Components of Health
 Definitions of Indicator and Index • <i>Selection of Health Status Problems</i>
 Policies
 Priorities
 Needs • <i>Criteria For Selecting A Health Status Indicator or Index</i>
 Input Criteria
 Availability
 Scaling problems (level of analysis and measurement)
 Assigning weights
 Common denominality or comparability
 Output Criteria
 Comprehensiveness vs. specificity
 Reflecting health status over time and among different populations (age and sex adjustments)
 Utility
 Program priorities | <ul style="list-style-type: none"> Evaluation
 Resource allocation
 Patient management • <i>Health Status Indicators and Indexes</i>
 Concepts to be Measured
 Operational Definitions
 Types of Indicators and Indexes (measures to be used) • <i>Identifying Community Health Problems Using Health Indicators and Indexes</i>
 Ranking
 Comparison
 Algorithm
 Risk Analysis • <i>Linking Health Status to the Health System Using Health Indicators</i>
 Risk Factor Analysis
 Regression and Correlation Analysis
 Health Service Delivery Analysis • <i>Presentation of Health Status Data</i>
 Descriptive
 Statistical
 Graphic |
|---|--|

Target Audience: State, local, and Federal health planners, statisticians, researchers, and administrators with planning responsibilities utilizing health status measures.

Prerequisites: Knowledge of basic descriptive statistics and familiarity with PL 93-641.

Length of Course: 4½ days

Director: Alan Dever

COURSE NO. 310.**Multiple Regression and the Analysis of Health Data**

45

Objectives: Regression analysis (simple linear and multiple) is a useful statistical tool for the analysis of health data. Using the techniques of regression requires understanding of underlying assumptions, limitations, and methods for handling complex data. Specifically, participants will be presented with the necessary information and practice to:

- derive simple linear and multiple regression equations
- execute tests of hypothesis on means, slopes, partial regression coefficients
- develop efficient predictive models using many variables
- distinguish between predictive, control, and functional models

Course Description: Beginning with first principles, the course deals with univariate linear regression, extension to the two-variable case, and subsequently to the multiple regression model. Computer programs used in doing the analyses are discussed and compared. Topics include:

- *Basic Statistical Concepts*
 - Data description
 - Probability distributions (normal, t, F)
 - Experimental design principles
- *Fitting a simple linear model*
 - Estimation of parameters
 - Properties of slope estimator
 - Lack of fit concept
 - Analysis of variance for regression
- *Fitting a Multiple Variable Model*
 - Concept of partial regression coefficients
 - Dummy variables
 - Assessment criteria for a model
 - Methods of selecting variables
- *Planning a Regression Analysis Study*
 - Experimental design
 - Flow-charting the procedure
 - Stopping rules for fitting models
 - Messy data problems
 - Pragmatic rules and recommendations
 - Regression computer packages (BMD, SPSS, etc.)

Lectures are supplemented by illustrative problems and problem-solving exercises.

Target Audience: Statisticians, researchers, and analysts who are working with health data.

Prerequisites: Familiarity and experience with statistical methods, including test of significance, confidence intervals, and analysis of variance.

Length of Course: 4½ days

Director: Harry Smith

COURSE NO. 312.**Statistical Methods for Analyzing Descriptive Data**

46

Objectives: Many statistics encountered in planning or analyzing health programs and disease processes are frequency counts of events. In this course, health planners and analysts will learn how to:

- extract data from cards or forms
- construct frequency tables
- make valid inferences from frequency counts
- write statistical reports based upon categorical data

Course Description: Although this course is job-oriented, some basic concepts will be introduced. In addition to lectures, students will work on specific projects in small group workshop sessions. The following topics will be covered:

- *Review of concepts in probability and statistics*
- *Construction of contingency tables from source documents*
- *Formulation of hypotheses and selection of models*
- *Derivation of estimates; Chi-square test statistics*
- *Partitioning contingency tables*
- *Three-dimensional and multiple tables*
- *Screening tests and applications in epidemiology*
- *Computer programs and complex cross-correlation tables*

Target Audience: Health planners and data analysts who have responsibility for the collection and interpretation of frequency data relating to health programs

Prerequisites: College algebra is a mandatory requirement plus one or more courses in probability and/or statistics.

Length of Course: 5 days

Director: Wanzer Drane

COURSE NO. 315.
Statistical Methods in Epidemiology

47

Objectives: Biostatistics is the basic tool of biomedical research, particularly epidemiology. This course will provide participants with the knowledge to:

- differentiate among various methods of conducting research studies
- design a data collection and analysis protocol for investigating an epidemic
- calculate primary and secondary attack rates where appropriate
- apply basic statistical procedures to the study of epidemics

Course Description: This course combines lectures with problem sessions. Topics include:

- *Methodology for Study Making*
 - Research designs and ways of collecting data
 - Controlled clinical trials
 - Procedure for investigating an epidemic
- *Study of an Epidemic of Infectious Disease (Typhoid Fever)*
 - Verification of diagnosis
 - Time and space analysis
 - Selectivity analysis
 - Environmental factors
 - Conclusions
- *Secondary Attack Rates*
 - Comparison of primary and secondary attack rates
 - Comparison of secondary attack rates
- *Selected Problems in studies of Chronic Disease and Genetics*
 - by sex and age
 - Susceptibility and immunity
 - Comparative effects of removal of cases and noncases
 - Relative risk, rate of prevention, competing risks
 - Relative risk under matching for retrospective studies
 - Etiological fraction in retrospective studies
 - Confounding in retrospective studies
 - Probands, sampling bias in ascertainment
 - Life table methods

Laboratory sessions are devoted to actual epidemiological data. Two overnight assignments are necessary to accomplish the goals of the course.

Target Audience: Public health workers and others concerned with epidemiological investigations.

Prerequisites: Some knowledge of elementary statistical methods, or experience in the conduct of epidemiological investigations and the analysis and interpretation of such data. (Statistical familiarity at the level of ASTI Course No. 300 will be assumed.)

Length of Course: 4½ days

COURSE NO. 400.
Demographic Analysis I

48

Objectives: Population growth and change in relation to individual characteristics (age, sex, race) and socio-economic factors are the subject matter of demography. This course is concerned with the tools of demography and their interpretation. The participant will learn to:

- interpret the importance of age and sex distributions in terms of "developing" and "developed" societies
- use various demographic formulas to measure growth rates of populations
- construct standardized or adjusted death rates by both indirect and direct methods
- construct and interpret population pyramids
- calculate fertility rates
- compute estimates of migration

Course Description: Lectures and practical problem-solving laboratory sessions are used to provide experience in manipulating data and interpreting the results. Specific topics include:

- *Introduction to Demography*
 - Trends in Population Growth
 - Tools of Demography
 - Population Characteristics and Their Interpretation
 - Construction of a Population Pyramid
 - *Statistics Used in Demography*
 - Mortality from all causes: "crude"
- (actual) rates vs. adjusted or standardized rates
Death rates by specific cause
Morbidity and Mortality: Trends
Fertility Rates—Overall and by Specific Factors
Trends in Illegitimacy
Migration—Measurement and Trends

Target Audience: Persons employed in statistical agencies, planning agencies, and Departments of Public Health.

Prerequisites: A working knowledge of college algebra and elementary statistics

Length of Course: 4½ days

Director: Everett Lee

COURSE NO. 401.
Demographic Analysis II

49

Objectives: The research and methodological techniques of demography are effective tools for implementation and management of public health and vital statistics programs. This course emphasizes the methodological aspects of demography and provides the student with information necessary to:

- identify types of demographic data and the sources of error
- apply appropriate techniques to demographic data in order to analyze
 - population composition
 - construct and interpret life tables
 - use period data and cohort data to study fertility

Course Description: Through a combination of lectures and laboratory exercises, this course provides advanced training in demography. Topics include:

- *Identification of types of demographic data (census, vital statistics, survey, social security)*
 - Basic concepts and recent trends (mortality, life expectancy)
 - Nature, structure, and use of standard life tables
 - Mortality by cause and multiple decrement life tables
 - Use of computers to construct single and multiple decrement life tables
 - Computation of mortality and longevity measures from single and multiple decrement life tables
- *Types of errors in demographic data: implications*
- *Techniques for reduction and analysis of observational data*
 - Tabular-graphic presentation and analysis of demographic data
 - Analysis of population composition (index of dissimilarity, index of relative composition)
 - Direct and indirect standardization of rates
 - Adjustment for two factors simultaneously
- *Mortality and longevity analysis*
 - *Period and cohort data*
 - Sources of cohort data
 - Period analysis and cohort analysis
 - Studies of fertility using cohort analysis
 - Measures of cohort fertility

Target Audience: Health professionals with responsibility for design, analysis, and interpretation of demographic studies.

Prerequisites: ASTI Course No. 400, or its equivalent.

Length of Course: 4½ days

Director: Ralph Frankowski

COURSE NO. 402.
Methods of Estimating Populations

50

Objectives: Making population estimates for sub-national units is a vital requirement for planning health programs. This course covers a variety of methods for making population estimates. The participant will learn to:

- use basic approaches to developing population estimates
- evaluate methodological options
- select appropriate methods for program purposes

Course Description: This course focuses on methodology and practical applications of techniques for estimating populations for subnational units. Topics include:

- *How to apply principles of population estimation and demographic concepts*
- *Comparisons of estimates versus projections*
- *Design of a population estimate program*
- *Evaluation of source data on variables affecting population*
- *Methods of population estimation: broad classes of techniques*
- *Discussions and workshops on selected estimation methods*
Mathematical methods, proration, and simple ratio methods
Component methods
Vital rates and composite methods
Ratio-correlation (regression) methods
Housing Unit methods
- *Accuracy of methods*

Target Audience: Technicians involved in the preparation of current population estimates and projections.

Prerequisites: College graduate or equivalent, with experience in working with and evaluating statistical data. Familiarity with demographic concepts and knowledge of mathematics or statistics is helpful but not essential.

Length of Course: 4½ days

Director: Frederick Cavanaugh

ASTI COURSE NO. 403.
Methods of Forecasting Populations

51

Objectives: Health planners and program managers need simple descriptive statistics on the population of the area served by their agencies. They must know current characteristics of the population and be able to perceive future changes in size and composition. This course will stress the concepts—not the mathematics—of projecting population. Students will examine the assumptions underlying various projection techniques for appropriateness and validity, and will analyze them in terms of their own situations. At the close of this course, the student will be able to:

- state assumptions underlying various projection methods and discuss their relevance to their own situation
- compare projected population size with the actual size of a population, and analyze any difference between projection and later actual population size
- state the limitations in existing methodology for predicting future size of a non-closed population

Course Description: The following topics will be covered:

- *The Task*
 - Sources of Forecasts
 - Goals of Project
 - Data detail required
 - Consequences of error
 - Organizational, Personnel Constraints
 - Time
 - Physical, monetary resources
 - Ability of staff
- *Technique Selection*
 - Project Goals
 - Comparative Accuracy of Techniques
 - Overview of Techniques and Methods
- *Demographic Dynamics*
 - Population Structure
 - Components of Change: Rate Structure
 - Selected Case Studies
 - Exercise: Age-specific Migration Rate Calculation
- *Review of Simple Projection Methods*
 - Extrapolating Total Population
 - Extrapolating Shares or Components of Change
- *Cohort-Component Methodology*
 - Introduction of Concept
 - Exercise: Calculation Using Irwin's Procedure
 - Debriefing Work Project
 - Notes on Quality of Data from Censuses and Estimates
- *State of the Art: Cohort-Component Techniques*
 - Mortality
 - Fertility
 - Migration
- *Other Topics*
 - Interfacing Economic Models
 - Urban Models
 - ARIMA Models

Target Audience: Planners and analysts who have requirements to make population projections.

Prerequisites: Participants should have facile knowledge of algebra.

Length of Course: 4½ days

COURSE NO. 601
Technical Report Writing

52

Objectives: Writing technical reports is a challenge to the author's sense of style, imagery, and a sense of the wholeness of the theme of the report. Too often, technical writers are content to tell the facts without resort to effective devices for adding interest and sparkle to the report. This course will help the student to:

- determine the special requirements of reports based upon the intended message
- use practical writing techniques
- distinguish between effective and ineffective style of writing

Course Description: The art of writing effective technical reports depends upon the knowledge and skill to be clear, concise, and interesting. This course is designed to refresh and renew the student's awareness of the choices and strategies open to the writer of statistical reports in the field of Public Health. Concerted practice will focus on the succinct use of salient, straightforward, precise wording of these reports; emphasis will be placed on the demographic structure of the receiving audience and the discrimination necessary in selecting the proper data for that receiver. Topics will include:

- *The Three Major Categories of Reports*
Annual reports, progress reports (to obtain continuing funding), and planning reports (to obtain approval and funding of new programs)
- *Practice Writing Techniques*
- *Message Variables*
One-sided presentation
- Stated or implied conclusions
Use or non-use of fear appeals
- *Logical Sequence Steps*
- *Word and Phrase Choices*
Invention
Style
Active
Empty
Gobbledygook

Prior to the course, a sample of the student's own writing must be submitted to the instructor as a basis for individual consultation.

Prerequisites: Participants should be familiar with or experienced in preparing, editing or approving statistical reports.

Target Audience: Health professionals responsible for preparing, editing or approving statistical reports (this is the final step following the gathering processing, analyzing and displaying of statistical data).

Length of Course: 4½ days

Director: John Straiton or Sandra Schor

COURSE NO. 604.**Tabular and Graphic Presentation of Data**

53

Objectives: After statistical data has been collected, its utilization is enhanced by effective presentation of the data. The student in this course will learn to:

- identify basic elements for representing and presenting data
- select the most appropriate and effective format for presentation
- design and develop tables, charts, and graphs

Course Description: This is a basic course in the methods and techniques for displaying statistical data using various tabular and graphic formats. Topics to be covered include:

- *Elements of table and chart construction*
- *Problems of misrepresentation of data*
- *Use of histograms, frequency curves, charts, matrix representation*
- *Practical exercises in preparing tables, graphs, charts*
- *Descriptive measures and comparative data presentations*

The course material will be presented in a series of lectures and workshop discussion sessions, giving the student the opportunity to develop, review, and evaluate presentation and reporting formats. Examples will be drawn primarily from the health field.

Target Audience: Individuals working with, or responsible for, the collection and summarization of statistical data for analytical or administrative reporting, who require a basic understanding of methods and techniques of displaying such information.

Prerequisites: Participants should have an understanding of basic mathematics and familiarity with, or experience in preparing and reporting statistical data.

Length of Course: 4½ days

Director: Pearl D. Fisher

COURSE NO. 605**Design and Composition of a Complete Statistical Report**

54

Objectives: A good technical report uses the most appropriate modalities for presenting information (tables, graphics, maps) and provides unifying narrative which conveys the principal message. This course prepares the student to:

- set up a pencil dummy of a complete statistical report
- prepare a time table for each stage of the process in generating a finished report
- design and construct tables, graphs, and maps from a set of source data
- critique the statistical report

Course Description: The statistician is ultimately required to transmit data-based intelligence through a "statistical report." This course takes the student through the step-by-step process of developing a mockup of a model report and uses real data to illustrate tabular, graphic, and mapping techniques. Topics include:

- *The Components of a Statistical Report*
Purpose and function of six common organizational components
Relationship of type and purpose of the report to the intended audience
- *The Pencil Dummy*
Purpose and function of a pencil dummy
Common components of all pencil dummies
Information displays
- *The Step-by-Step Process for Producing a Report*
Scheduling procedures—the time completion chart
Adaptation from the general case to the specific
- *Design and Construction of Tables*
Layout of the master table
Partitioning the master table
Construction and interpretation of summary tables
Narrative comments on tables
- *Graphics*
Types and uses
Techniques for preparing line graphs, histograms, population pyramids
Interpretation of graphics
- *Mapping*
Types, uses, and advantages of mapping
Computer assisted mapping-software packages
Production of interpretable maps
- *The Complete Statistical Report*

This course makes use of real data and a specific topic to execute illustrative tables, graphs, and maps and to construct a pencil dummy of a complete statistical report.

Prerequisites: Applicants should have responsibility for preparing statistical reports from source data.

Target Audience: Statistical analysts, technical writers, and information specialists.

Length of Course: 4½ days

Director: Alan B. Humphrey, Ph.D.

COURSE NO. 702.**Automatic Data Processing and Computer Terminal Usage**

55

Objectives: The ready availability of computers has influenced systems of records and information management. This course provides a non-technical overview of automatic data processing principles and systems, with an in-depth look at computer terminal usage. The participants will learn to:

- distinguish between various processing modes
- identify standard computer equipment with their uses
- trace through the steps of systems analysis and systems design of an automated data processing application
- identify characteristics and concepts of on-line interactive computer systems
- distinguish among different file structures for on-line systems
- use various query languages for interacting with the computer

Course Description: The material presented is oriented toward the user of data processing services, rather than the provider of such services. Topics include:

- *Computer Equipment*
Input/output equipment (punched card machines, tapes, disks, and printers)
Characteristics of storage devices
Peripheral equipment (sorter, terminals, collator)
Principles for selecting appropriate computer configuration
- *Processing Modes: Advantages and Disadvantages*
Batch
Multiprocessing
On-line
- *Systems Analysis and Design*
Steps in implementation of an automatic data processing system
Tools and techniques for automatic data systems analysis and design
Programming languages
Specifications for output reports
- *On-line Computer Systems*
Characteristics and examples of on-line systems
Terms and concepts of on-line systems
Design criteria for on-line systems;
Selection of hardware and software
Telecommunications: data sets, terminals, lines, and line costs
- *Data Storage and Retrieval*
Characteristics of file structures for on-line systems
Data storage and information retrieval techniques
- *Interaction With the Computer*
Query languages
Communication formats (free, computer prompting, and fixed)
Demonstration with terminals

Target Audience: Statisticians and other health workers who are engaged in data collection and analysis or program management, but not in data processing.

Prerequisites: No formal prerequisites

Length of Course: 4½ days

Director: William Senter

COURSE NO. 709.
Biostatistical Software for Health Applications

56

Objectives: This course is designed to acquaint statistical analysts with some useful generalized statistical software which are particularly appropriate for processing health data. The student will learn to:

- identify the input and output specifications of selected statistical software packages
- organize and format primary data
- prior to using the software package select the appropriate software package for specific data processing requirements

Course Description: Through a combination of lectures and practical laboratory exercises, the student will become familiar with computer programs useful for analyzing health data. Topics include:

- *Generalized Statistical Packages: An Overview*
Statistical Package for the Social Sciences (SPSS)
Statistical Analysis System (SAS)
Table Producing Language (TPL)
Bio-Medical Series (BMD)
- Specification of fields, types of input, operations, controls and edits, outputs
Options available for processing
- *Description and examples of utility software developed at NCHS*
- *Preparing data for computer input*

Target Audience: Personnel of State and local health agencies who use computers for statistical analysis of health data.

Prerequisites: General knowledge of data processing and working knowledge of statistics.

Length of Course: 4½ days

Director: William Spillane

COURSE NO. 801.**Basic Cause-of-Death Classification**

57

Objectives: Mortality statistics derived from death certificates depend upon correct identification of the underlying cause of death. This course focuses on the current revision of the *International Classification of Diseases (ICD)* as the references for selecting codes for causes-of-death reported on death certificates. Participants will be trained to:

- use *Volumes I and II of ICD* to identify appropriate codes
- apply rules for selecting the underlying cause-of-death from entries made on death certificates
- use instructional reference materials on coding diseases

Course Description: This course provides intensive practical training to develop skill in coding diseases according to the ICD system of classification. Topics include:

- *Data recorded on death certificates*
 - Causes-of-death
 - The concept of underlying causes-of-death
 - Rules for selecting the underlying cause-of-death
- *Coding causes-of-death*
 - Using the ICD reference system
 - Selecting the proper code for conditions reported on death certificates

Target Audience: Persons responsible for coding of mortality statistics.

Prerequisites: Attendance is generally restricted to those persons who have direct hands-on responsibility for mortality classification at the State and local level. Others wishing to attend the course must have the prior approval of the course director.

Length of Course: 10 days

Director: Christine Heath

COURSE NO. 802.
Advanced Cause-of-Death Classification

58

Objectives: This course is intended for coders with experience in using the *International Classification of Diseases (ICD)* for assigning codes to the underlying cause-of-death recorded on death certificates. The participant will become more skilled in the system and will be able to assign mortality codes with greater accuracy.

Course Description: This is a refresher course for coders with at least one year of experience in using the ICD to code the underlying cause-of-death. Topics include:

- *Rationale for mortality classification*
- *Practical exercises in coding problems*
- *Rules for coding causes-of-death*

The workshop method is used to identify problems and to sharpen the skills required in the proper use of the ICD.

Target Audience: Cause-of-death coders with at least one year's experience.

Prerequisites: As with Course No. 801, attendance is generally restricted to those persons who have direct hands-on responsibility for mortality classification and who have had one year's experience in coding.

Length of Course: 5 days

Director: Margaret Sykes

COURSE NO. 803.**Nature and Use of Mortality Data System**

59

Objectives: This course will provide the student with a better understanding of the mortality data system and how to utilize the data with appropriate qualifications. Participants will gain the knowledge to:

- access the mortality data system
- identify causes of death
- prepare and process data
- identify sources of data
- analyze and use data

Course Description: This course focuses on the mortality data system and outlines the steps from data collection through data analysis.

- *A review of the death registration system*
 - data collection instruments
 - revision of death certificates
 - nature of medical certification process: its limitations and inadequacies
- *Introduction to mortality classification*
 - medical concepts and terminology
 - international classification (ICD-9)
 - underlying cause of death
 - multiple causes of death
- *Data preparation and processing*
 - quality control
- *Data access, retrieval, and dissemination*
 - editing
 - reformatting
 - up-coding
 - public-use tapes
 - publications
 - on-line data systems
 - data availability by geographic and demographic variables
- *Data use*
 - analysis
 - interpretation
 - application

Lectures, small group discussions and exercises are included in the presentation.

Target Audience: Statisticians, registrars, program managers, health planners, data processors, and other health professionals. Not appropriate for coders.

Prerequisites: None

Length of Course: 3 days

Director: Harry Rosenberg

COURSE NO. 805.
Morbidity Classification Systems

60

Objectives: This course focuses on morbidity classification systems. Students will acquire knowledge to:

- use medical terms in mortality and morbidity classification
- differentiate between mortality and morbidity classification
- apply principles of morbidity classification
- prepare, aggregate, and use data

Course Description: Data collection and preparation, uses of major classification systems, and the effects of revisions in interpreting morbidity data are addressed in this course:

- *Basic medical terminology applicable to mortality and morbidity data systems*
- *Major classification systems and their uses*
- *Source documents and data collection*
- *Effects of revisions in International Classification of Diseases on the interpretation of morbidity data*
- *Morbidity classification principles--contrast between morbidity and mortality classification*
- *Data preparation, aggregation, and use*

Course material is presented through a combination of lectures, small group discussions, audio-visual aids, and exercises.

Target Audience: Statisticians, health planners, registrars, data processors, program managers, and other health professionals. Not appropriate for coders.

Prerequisites: None

Length of Course: 3 days

Director: Sue Meads



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